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Disclosing the mystery of *"Messor caducus"* MOTSCHULSKY (Hymenoptera, Formicidae)[1]

C. BARONI URBANI[2], N. AKTAÇ[3] & Y. ÇAMLITEPE[3]

[2] Zoologisches Institut der Universität, Rheinsprung 9, CH-4051 Basel, Switzerland
[3] Trakya Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 22030 Edirne, Turkey

The authors give abundant evidence that the head chaetotaxy of the workers of *Messor semirufus* (ANDRÉ, 1881), though probably genetically determined, cannot be used as a taxonomically discriminant character.

The binomen *Formica caduca* VICTOR, 1839, recently emended for some more hairy specimens of *Messor semirufus*, and wrongly cited as *Messor caducus* (MOTSCHULSKY), is proposed to be regarded as *Messor incertae sedis*, because the type material is not available. This is intended to promote nomenclatural stability.

Messor atanassovi ATANASSOV, 1982, described from S. Bulgaria, is an unavailable name but no replacement name is proposed because this is also likely to be a synonym of *Messor semirufus* (ANDRÉ).

INTRODUCTION

Splitting an established taxon into two is a daily routine for every taxonomist. When one of the two resulting taxa bears a *"nomen oblitum"* (i. e., unknown to all students of the group and never having appeared even as a synonym in any paper over the last 50 years) and when, moreover, the original publication is not mentioned by the author emending the forgotten name, some elements of doubt can arise. This is the case of *Messor semirufus* and *M. caducus*. There are two pressing reasons for wanting to clarify the taxonomic status of this ant species complex: (1) One of the two newly defined species is supposed to have a broad distribution in S. Europe, S. Russia, and Asia Minor where it may be regarded as one of the commonest ones, and (2) we recently began a series of observations on the behavioural ecology of this species of which the first is appearing in print (BARONI URBANI, 1989). This species could have a remarkable impact on the vegetation by collecting huge numbers of seeds, consuming some and storing the remainder at different depths in the soil. Thus this ant species generates several dormant seed banks available for reintroduction into the local vegetation under different degrees of disturbance (BARONI URBANI & AKTAÇ, in preparation). It is hence important to have the correct name for the ant we are dealing with.

We are aware that the use of *nomina oblita*, previously prohibited by the Code of Zoological Nomenclature, is now permitted, though not encouraged, by the last edition of the Code (1985) (see Art. 79 [b][iii] and 79 [c]). Two reasons are

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given as valuable to suppress an unused senior synonym: (1) The senior name may not have been used as a valid name during the last fifty years – in the case of *"Messor caducus"* this name was never used even as a synonym from 1921 until 1981. (2) The junior name must have been applied by at least 5 different authors and in at least 10 publications during the same time – a condition which, in our case, is met by several junior synonyms.

Unfortunately, the latest edition of the Code does not allow automatic suppression of names fitting the previous definition as it used to be before, but demands the intervention of the Commission on Zoological Nomenclature in order to decide. Without an official decision of the Commission such forgotten names may have nomenclatural status according to the Priority Law. The name to which we are objecting in this paper, moreover, has been used again in four different papers at least in the last few years.

What makes the *"Messor caducus"* case even more confusing is that the types of most relevant involved taxa have been lost or ignored by the authors who recently dealt with this binomen. This means that most uses of one specific name or another are products of speculation rather than the result of comparison with extant type material. For this reason we refer to the synonymic list by BARONI URBANI (1974) – the only one for this species published after the "Genera Insectorum" (EMERY, 1921) – as a guide-line only and we prefer to individually comment on what appear to be the most pertinent individual papers contributing to the present taxonomic and nomenclatural difficulties. In fact, if the separation between the widely known *Messor semirufus* and *"Messor caducus"* as suggested by SCHEMBRI & COLLINGWOOD (1981) will prove to be untenable, *"caducus"* is going to be the oldest available name for one of the commonest Mediterranean insects *(Messor semirufus)*.

Caducus is a Latin adjective meaning transitional, destined to fall. The purpose of the present paper is to see whether its destiny as an ant name within zoological nomenclature can be better than implied by the name itself, and to describe some aspects of the variability of this taxon.

HISTORICAL AND CRITICAL

ANDRÉ (1881) is generally credited for giving the first description of the species complex dealt with in this paper. On the same page (355) two closely related taxa are described, i. e. *Aphaenogaster barbara* var. *semirufa* (from Caspian Sea, Syria, Persia and Abyssinia) and *Aphaenogaster barbara* var. *meridionalis* (from Greece, Albania, Costantinopolis, Algeria and Tunisia). The two are distinguished essentially by the colour (head and trunk red with gaster black for var. *semirufa* and head and gaster black with trunk red in var. *meridionalis)*. Other characters, like size, sculpture, and propodeal dentition are also mentioned but admitted as variable.

Ten years later EMERY (1891), on the basis of colour matching from the respective descriptions, synonymized the var. *semirufa* ANDRÉ, 1881 with *Formica caduca* MOTSCHOULSKY, 1839. The synonymy is reported in the catalogue by DE DALLA TORRE (1893) and was accepted by RUZSKY (1905) who went a step further in employing for the first time the binomen *Messor caducus* and dealt with it as with a good species. This elicited a prompt reaction from EMERY (1908) who, apparently, not only disagreed strongly with RUZSKY (p. 447, footnote 1: «was mir... nicht gerechtfertigt erscheint... da Ruzsky nicht angibt, Original-

exemplare untersucht zu haben . . .»), but also changed his mind about the probable attribution of the name *caducus* to this species group because "Motschoulskys Beschreibung durchaus schlecht ist". This is, to our knowledge, the last mention of the name *caducus* referring to a species of the genus *Messor* until 1981, exception made for the "Genera Insectorum" (EMERY, 1921) where, under the synonyms of *Messor barbarus* ssp. *semirufa* ANDRÉ, the name *Formica caduca* MOTSCHOULSKY appears, but preceded by a question mark.

In the meanwhile, our knowledge of this species complex has increased through two comprehensive papers by SANTSCHI (1927) and KUZETZOV-UGAMSKIJ (1929). These ants are aesthetically pleasing, variable, and widely distributed and thus are of interest to collectors. This explains that the group has received much taxonomic attention in the past, leading to a considerable proliferation of infrasubspecific names around the original *Messor semirufus*. BARONI URBANI (1974) proposed the synonymy of 11 taxa originally described essentially as chromatic varieties of a presumed typical form. The type originated from the Middle East where it lives sympatrically with most of its colour varieties. We maintain that all characters mentioned in the original descriptions of these taxa vary as demonstrated by the specimens cited in the paper by BARONI URBANI (1974). We are willing however to accept that some of these taxa may be rescued if new characters are employed as is done in part by AGOSTI & COLLINGWOOD (1987 b), characters which may eventually prove to be consistent within large series and corresponding to the relative type material, two conditions possibly met but never stated in any published paper of our knowledge. Apropos colour variation and its use as a taxonomic character in this group, we can add now that workers born in laboratory in Basle from queens collected in Turkey are consistently darker than their sisters collected in the field. We suggest that darker colouration results from the more proteic diet fed under laboratory conditions.

In 1981, SCHEMBRI & COLLINGWOOD unexpectedly emended the name "*Messor caducus* MOTSCHULSKY" for a population from the Maltese Islands already determined as *M. semirufus* by BARONI URBANI (1968, 1974). This new definition for *M. caducus* is justified by the fact that "the Maltese form compares well with some series from Turkey named *M. caducus* on the basis of the original descriptions [sic] of this species by MOTSCHULSKY (B. S. BOLTON, personal communication)".

On the basis of this precedence case in the literature, *Messor caducus* has been cited from the province of Edirne in Turkey by ARAS & AKTAÇ (1987), and from Greece and Turkey in the "synonymic list" by AGOSTI & COLLINGWOOD (1987 a). In this list the widely established name *Messor semirufus* (ANDRÉ), which is the name most commonly used in the literature dealing with this area, no longer appears, even as a synonym.

However, both SCHEMBRI & COLLINGWOOD (1981), and AGOSTI & COLLINGWOOD (1987 b), give a short morphological characterization of "*Messor caducus* MOTSCHULSKY". In the first paper *caducus* is stated to differ from *semirufus* (given as *M. meridionalis)* in at least three pilosity characters concerning the antennal scape, the first gastral segment and the occipital border. The latter character is interpreted as the most important one and the accompanying figure shows two clearcut specimens, one with 10 standing hairs per side *(caducus),* and the other with 4 standing hairs only, given as *meridionalis* (= *semirufus).* In the second paper by AGOSTI & COLLINGWOOD (1987 b) supposed to be "a key of the Balkan ants . . . including the European species without the Iberian", the situa-

tion became a bit more puzzling in that both formerly recognized taxa *(semirufus* and *meridionalis)* disappeared completely. On the other hand, the majority of the chromatic varieties synonymized with *semirufus* by BARONI URBANI (1974) are raised again to specific level, making the comparison more difficult. Anyway, at least "*Messor caducus* (MOTSCHULSKY)" is definitely in the key preceded by the dichotomy "head and gaster dark . . ." to distinguish it from *M. minor,* and accompanied by the dichotomy "occiput with at least six hairs on the median line; pronotum smoothly rounded in dorsal view" (= *caducus),* as opposed to "occiput with four or fewer hairs on each side of the median line; pronotum dorsally somewhat flattened with lateral protuberant bosses" (= *concolor* = *semirufus* sensu BARONI URBANI, 1974).

In absence of the type material which has probably been lost or destroyed, it appeared even more important for us to see the original description of "*Messor caducus* MOTSCHULSKY". We were unable to find any description of *Formica caduca, Myrmica caduca,* or *Messor caducus* (the three generic assignments appear in the literature) by MOTSCHULSKY (English transliteration of the name) or MOTSCHOULSKY (French transliteration of the name). The only description of an ant with this name appears to be the one of *Formica caduca* from the banks of the Araxe River (Armenia) (today Aras or Araks River on the boundary between Iran and USSR) given by VICTOR (1839). We must admit that we were probably among the few taxonomists ignoring that T. VICTOR is simply the pseudonym used by the Russian entomologist V. VON MOTSCHULSKY after he was prohibited from publishing descriptions of new insect species for political reasons. This pseudonym is listed after the name of VON MOTSCHULSKY by HAGEN (1863) who also refers to the 1839 paper with the authorship of VON MOTSCHULSKY. We feel, nevertheless, that the correct citation of authorship enabling future students to locate the original description of this taxon should be *Formica caduca* VICTOR, 1839. As already stated by EMERY (1908), the original description is rather useless for defining this taxon by modern standards. The only element of interest appearing from the diagnosis reads as follows: "Atra,... capite, thorace, tarsisque rubidis . . ." and this is repeated in the more detailed description as "La tête est... rougeâtre...". The only deduction that can be made from the original description is that *Formica caduca* can not be the same as *Messor caducus* as defined by SCHEMBRI & COLLINGWOOD (1981) and by AGOSTI & COLLINGWOOD (1987 b) for which the character "head dark" is used as a diagnostic character to separate it from other species.

VICTOR (= MOTSCHULSKY) made no mention of the pilosity of the head of his specimens, but, the fact that SCHEMBRI & COLLINGWOOD (1981) and AGOSTI & COLLINGWOOD (1987) split the former *Messor semirufus* into two, equally common, often sympatric, species on the basis of head chaetotaxy remains. The remaining part of this paper is devoted to analyze the consistency and the possible variability of this character.

CHAETOTAXY OF SOME THRACEAN POPULATIONS

Because we already had the opportunity to do field work on *Messor* populations of Thrace (European part of Turkey), we started analyzing the representative samples available to us from this area and deposited in the collection of the Department of Biology of the University of Thrace.

In a first set of counts, we tried to separate the Thracean populations into two sets matching the general *"semirufus"* and *"caducus"* phenotypes by colour, general pilosity, etc. and counted separately the number of standing occipital hairs on the left and right side which enabled us to have two numerical values per specimen. A total of 54 specimens of different size from 29 nest series were studied in this way for head chaetotaxy, using no more than two specimens per nest. The material we used for this study came from the following localities, all in the district of Edirne:

Sulika-Kesan, 4.10.1986; Büyünlü-Lalapasa, 10.9.1986 (2 nest series); Orhaniye, 23.5.1986; Yolageldi-Havsa, 19.9.1985 (2 nest series); K. Döllük, 1.5.1986; Musabeyli, 2.5.1986 (4 nest series); Kabaagaç-Havsa, 19.9.1985; Karabulut, 26.9.1985 (2 nest series); Hidiraga, 12.9.1985 (2 nest series); Sofular, 12.9.1985 (2 nest series); Kemalköy, 12.9.1985; Karapinar-Uzunköprü, 16.9.1986; Donköy-Lalapasa, 10.9.1986 (3 nest series); Haciumur, 2.5.1986; Hamidiye-Uzunköprü, 16.9.1986; Kocahidir-Kesan, 4.10.1986; Mecidiye-Kesan, 4.10.1986; Kircasalih, 19.6.1986; Süleymaniye-Uzunköprü, 16.9.1986.

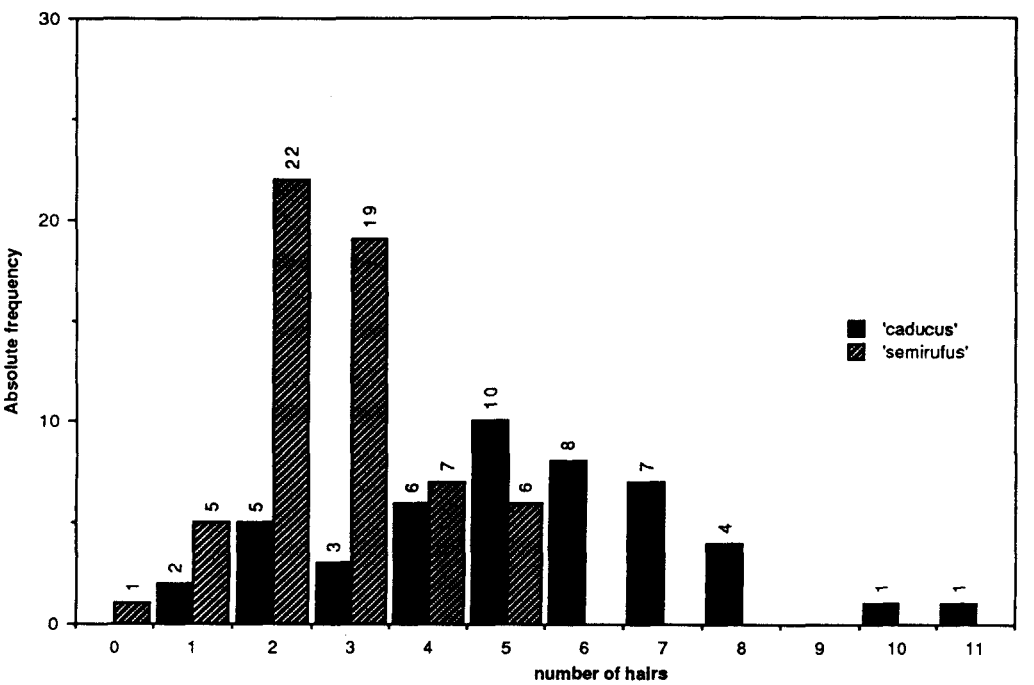

Fig. 1. Variation of the number of standing hairs on the left and right sides of the occipital border among 54 specimens of *Messor semirufus* representing 29 different nests, all collected in Thrace. For the detailed list of localities see text.

The results are given at Fig. 1. Head chaetotaxy in these specimens shows two different distributions for the two sets we arbitrarily considered as representative of the two potentially different species. However, the two distributions overlap largely and 16 cases (ca. 15%) show the critical macrochaetae number of 5 per side which should represent the gap between the two taxa under discussion. The range for our arbitrary *"semirufus"* is 0–5 macrochaetae per side and for our arbitrary *"caducus"* 1–11.

To better understand the variability appearing for the first time from these results, we proceeded to another set of seta counts as just described on 30 larger nest series of workers, also deposited in the collection of the Department of Biology of the University of Thrace. Because our species is likely to be strictly monogynous (like most other *Messor*, and confirmed by our own field observations on this species), these data should allow us to have an insight into the pattern of variation of the head chaetotaxy and its possible source.

Fig. 2 gives graphically the results of our counts and the consecutive nest numbers correspond to the following localities:

#1. Musabeyli köyü-Edirne, 17.3.1989 (meadow) (n = 49). #2. Same locality as before, 21.3.1989 (n = 50). #3. Tip Fakültesi Kampüsü-Edirne, 7.4.1989 (river bank) (n = 50). #4. Ömeroba köyü/Lalapasa-Edirne, 12.10.1986 (stony river bed) (n = 9). #5. Kabaagaç k./Havsa-Edirne, 19.9.1985 (meadow) (n = 20). #6. Yolageldi köyü/Havsa-Edirne, 19.9.1985 (meadow) (n = 19). #7. Kocagöl/Igneada-Kirklareli, 20.9.1985 (cultivated field) (n = 22). #8. Dereköy/Lalapasa-Edirne, 10.2.1986 (oak forest) (n = 22). #9. Sofular köyü-Edirne, 12.9.1985 (meadow) (n = 14). #10. Yolageldi köyü/Havsa-Edirne, 19.9.1985 (meadow) (n = 10). #11. Kemalköy-Edirne, 26.9.1985 (meadow) (n = 16). #12. Hidiraga köyü-Edirne, 12.9.1985 (river bank) (n = 22). #13. Suluca köyü/Kesan-Edirne, 4.10.1986 (meadow) (n = 15). #14. Hidiraga köyü-Edirne, 12.9.1985 (meadow) (n = 12). #15. Karabulut köyü-Edirne, 26.9.1985 (meadow) (n = 26). #16. Mecidiye/Kesan-Edirne, 4.10.1986 (meadow) (n = 15). #17. Büyünlü köyü/Lalapasa-Edirne, 10.9.1986 (meadow) (n = 19). #18. Musabeyli köyü-Edirne, 2.5.1986 (meadow) (n = 14). #19. Karabulut köyü-Edirne, 26.9.1986 (meadow) (n = 14). #20. Haciumur köyü-Edirne, 2.5.1986 (pasture) (n = 12). #21. Musabeyli kökü-Edirne, 2.5.1986 (pasture) (n = 11). #22. Idem, other nest (n = 13). #23. Kirkasalih-Edirne, 19.6.1986 (pasture) (n = 18). #24. Sofular köyü/Edirne, 12.9.1985 (meadow) (n = 16). #25. Donköy/Lalapasa-Edirne, 10.9.1986 (meadow) (n = 19). #26. Donköy-Edirne, 10.9.1986 (meadow) (n = 19). #27. Hamidiye/Uzunköprü-Edirne, 19.9.1986 (meadow) (n = 9). #28. Süleymaniye köyü/Uzunköprü-Edirne, 16.9.1986 (meadow) (n = 15). #29. Geçitagzi köyü/Dereköy-Kirklareli, 17.7.1985 (oak forest) (n = 16). #30. Kula köyü/Kofçaz-Kirklareli, 16.7.1985 (oak forest) (n = 14).

Figure 2 shows that the variance in the number of hairs within each single nest series is smaller than the variance within the total population. This difference could result from genetic differences among nests or from microhabitat/environmental differences (FALCONER, 1986). However, in spite of the high degree of relatedness among individuals in our nest series due to monogyny, it is not possible to distinguish these two hypotheses without controlled experiments.

CONCLUSION

Though chaetotaxy in the occipital area of the workers belonging to the *Messor semirufus* complex is very likely to be genetically determined, individual variation in the Thracean populations is so high as to prevent the use of this character for separating two species. The variability range of the less hairy population separated as *Messor semirufus* s. str. overlaps entirely the one observed for the newly emended *Messor caducus* as defined by SCHEMBRI & COLLINGWOOD (1981) and AGOSTI & COLLINGWOOD (1987 b).

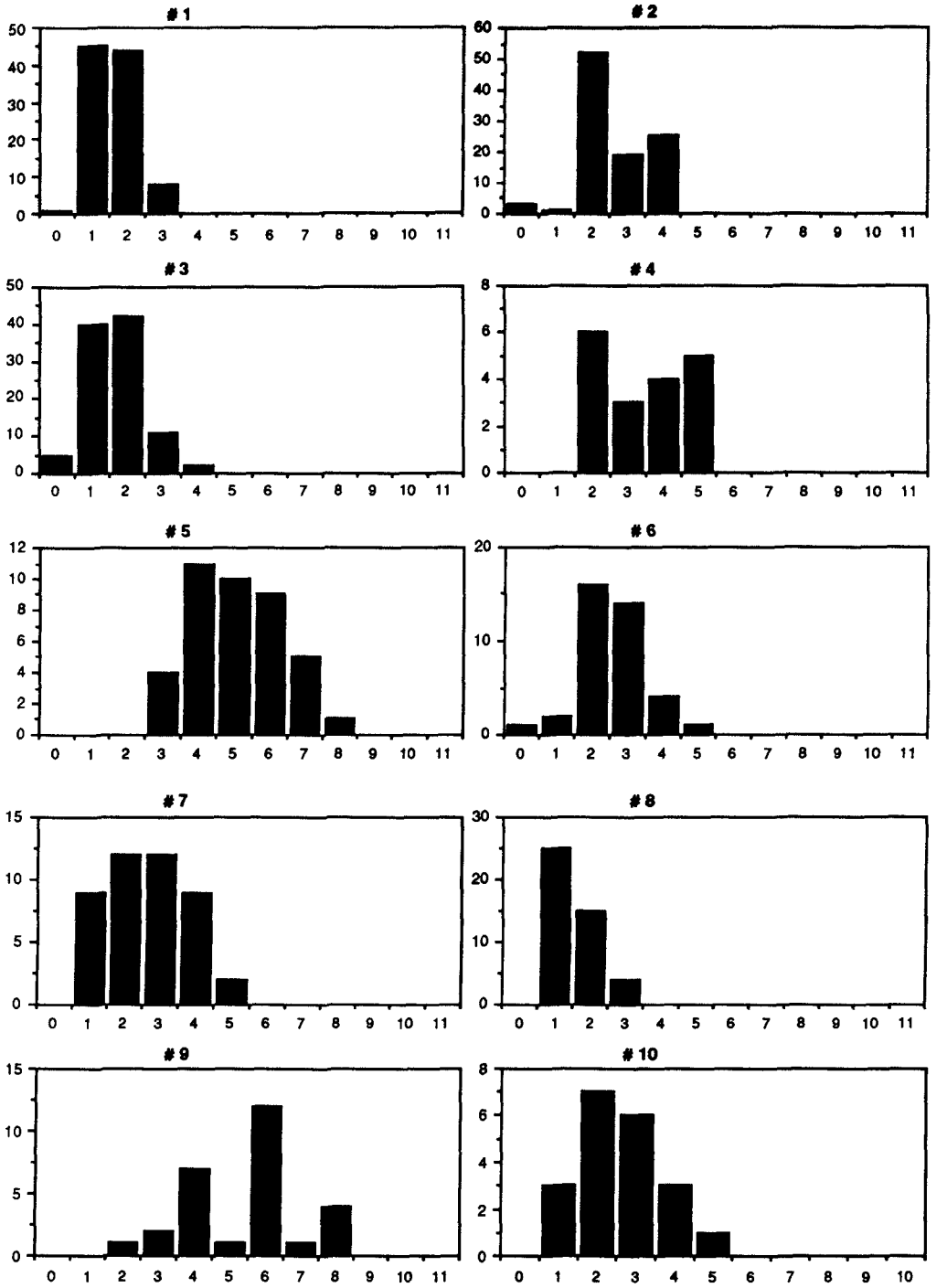

Fig. 2a. Relative frequency of the number of hairs on 1160 left and right sides of the hemioccipital border representing 30 nest series of *Messor semirufus* from different Thracean localities. For further details see text.

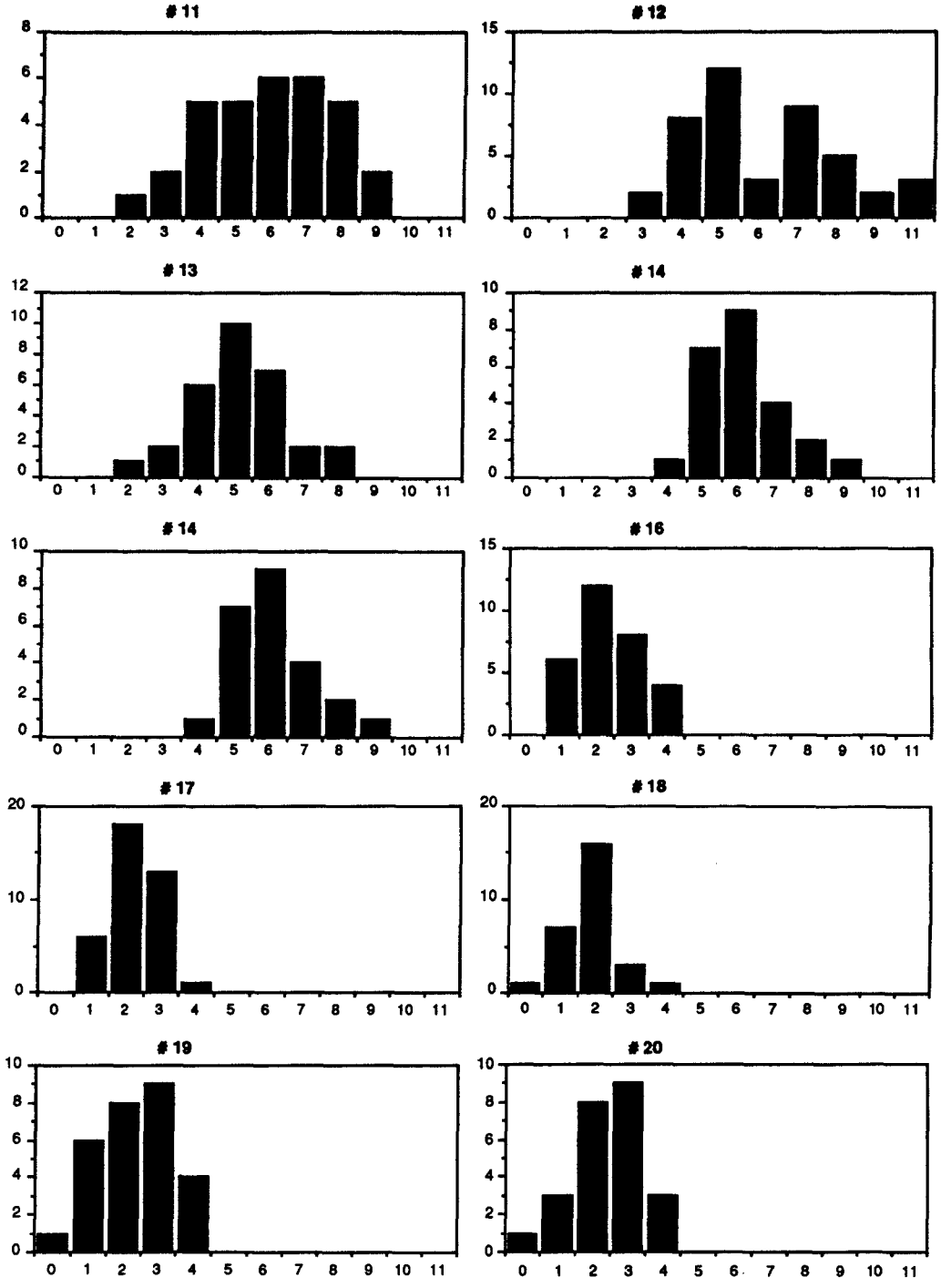

Fig. 2b. Fortsetzung von Fig. 2a.

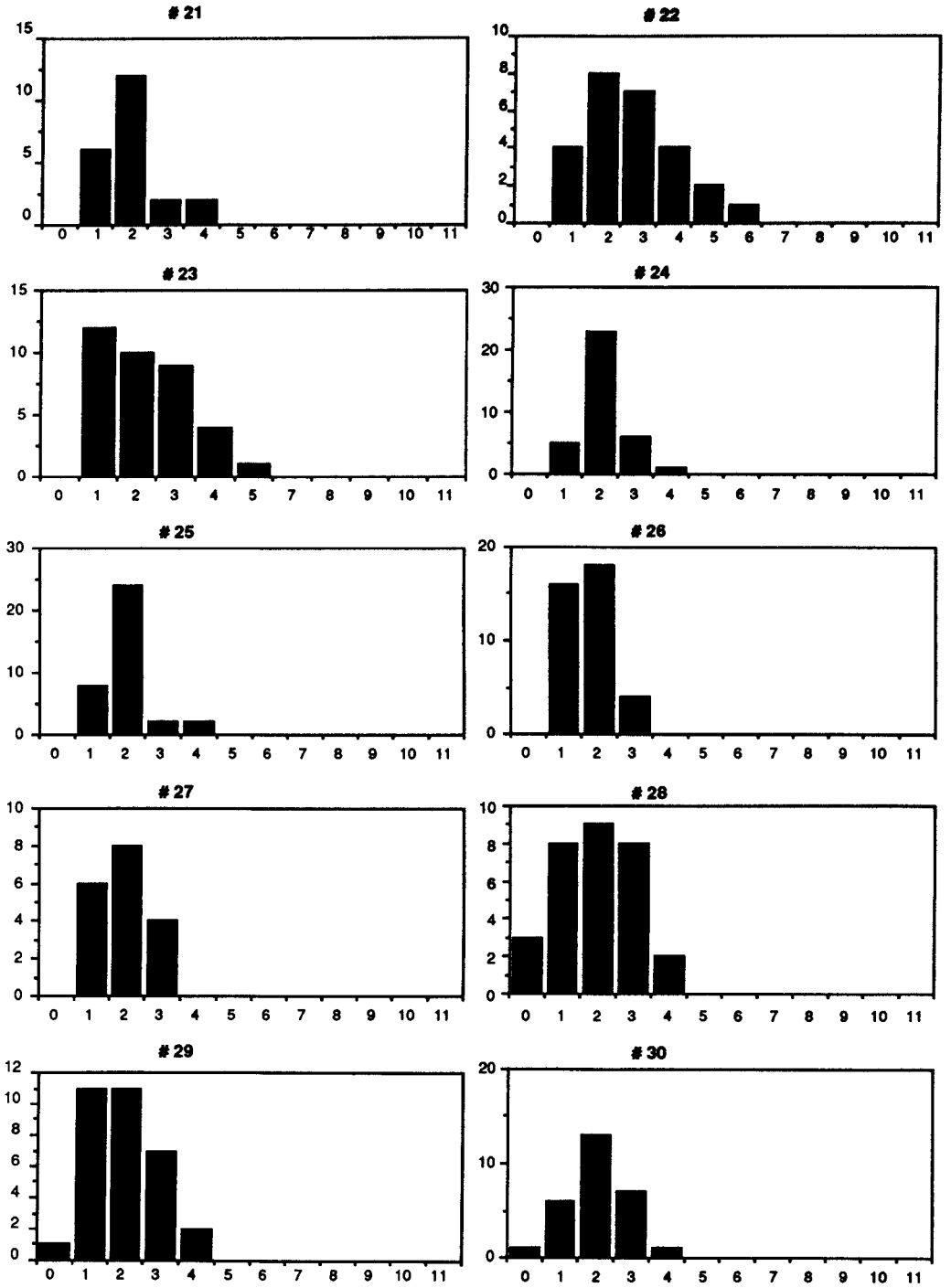

Fig. 2c. Fortsetzung von Fig. 2b.

If variation in the colour of the head is also regarded as the product of individual, non specific, variation as already done by BARONI URBANI (1974), *Formica caduca* VICTOR, 1839 should be regarded as the oldest available name for the common S. European and Middle Eastern ant previously known as *Messor semirufus* (ANDRÉ, 1881).

We consider this synonymy highly probable, though not formally demonstrable, because the type material is impossible to locate.

In the interest of nomenclature stability and understandability we propose, hence, to maintain a doubtful status for *Formica caduca*, as already done by EMERY (1908, 1921), and continuing the use of the widely established name *Messor semirufus* (ANDRÉ).

We refrain from continuing a more formal action in this direction by referring to the International Commission on Zoological Nomenclature because we are convinced that too many papers had already been involved in a simple case which would have not arisen at all simply by reading the original description or by examining more representative series of specimens.

APPENDIX

We take this opportunity to call the attention of taxonomists on the fact that the ant described as new from the Bulgarian part of Thrace by ATANASSOV (1982) under the name *Messor atanassovi* also bears an unavailable name according to the International Code on Zoological Nomenclature, Art. 13 (a) (i). This name, in fact, has been proposed in a description lacking any diagnostic characters that differentiate the species from any other taxa. We presume that no replacement name will be necessary for this ant, because, from the scanty information we were able to extract from two pages and three figures representing the original description, we believe that there are very good chances that it also represents the same taxon called *Messor semirufus* (ANDRÉ) throughout this paper.

ZUSAMMENFASSUNG

Die Verfasser zeigen, dass die Kopfbehaarung bei der Ameise *Messor semirufus* (ANDRÉ, 1881) sehr wahrscheinlich genetisch bestimmt ist. Dieses Merkmal kann aber unter keinen Umständen als taxonomisch diagnostisches Merkmal benutzt werden.

Das Binom *Formica caduca* VICTOR, 1839 ist ein *nomen oblitum*, obwohl der Name *Messor caducus* (MOTSCHULSKY) für einige mehr behaarte Exemplare von *Messor semirufus* in der Literatur wieder verwendet wurde.

Da sehr wahrscheinlich alle Typusexemplare von *Formica caduca* verlorengegangen sind, ist vorgeschlagen worden, diesen Namen als *Messor incertae sedis* zu betrachten, um die nomenklatorische Stabilität zu fördern.

Messor atanassovi ATANASSOV, 1982, aus Südbulgarien beschrieben, ist ein nicht verfügbarer Name. Für diese Ameise wird kein Ersatzname vorgeschlagen, da sie vermutlich auch mit *Messor semirufus* ANDRÉ identisch ist.

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